

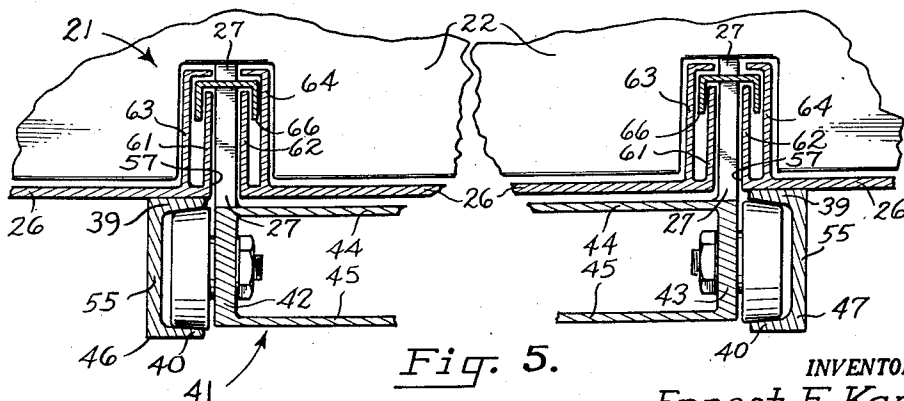
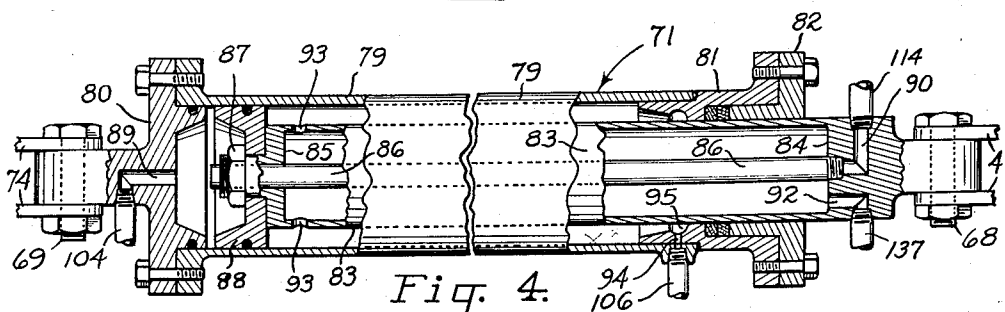
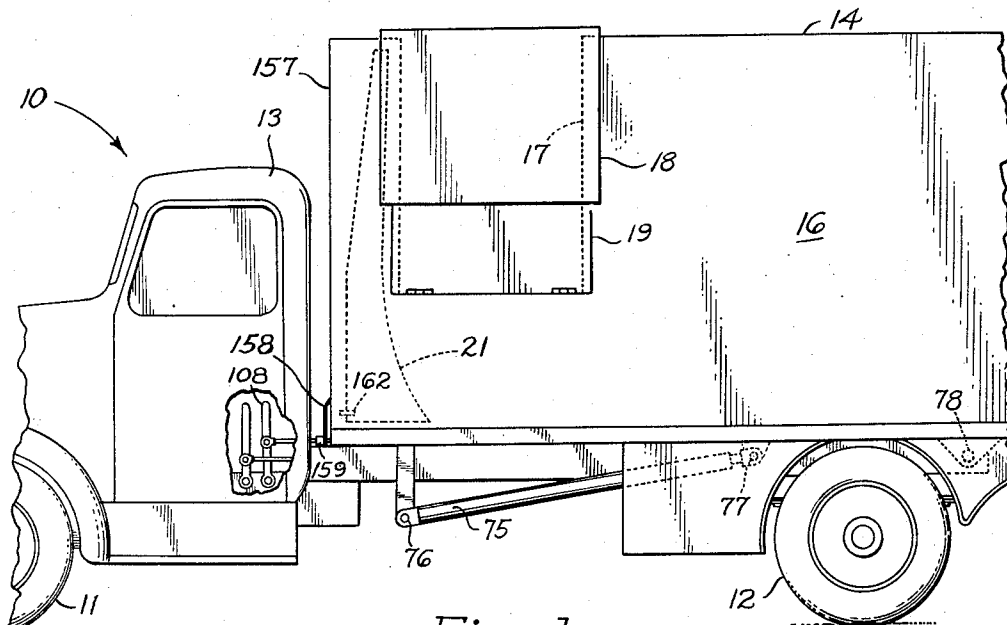
Nov. 10, 1959

E. F. KAMIN
REFUSE VEHICLE

2,912,128

Filed May 20, 1957

3 Sheets-Sheet 1



INVENTOR.
Ernest F. Kamin
BY
Ramsey and Kolisch
Attys.

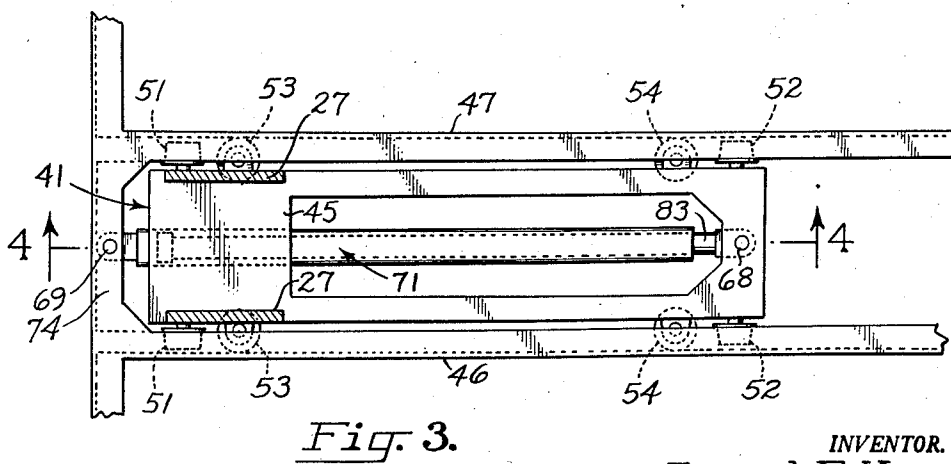
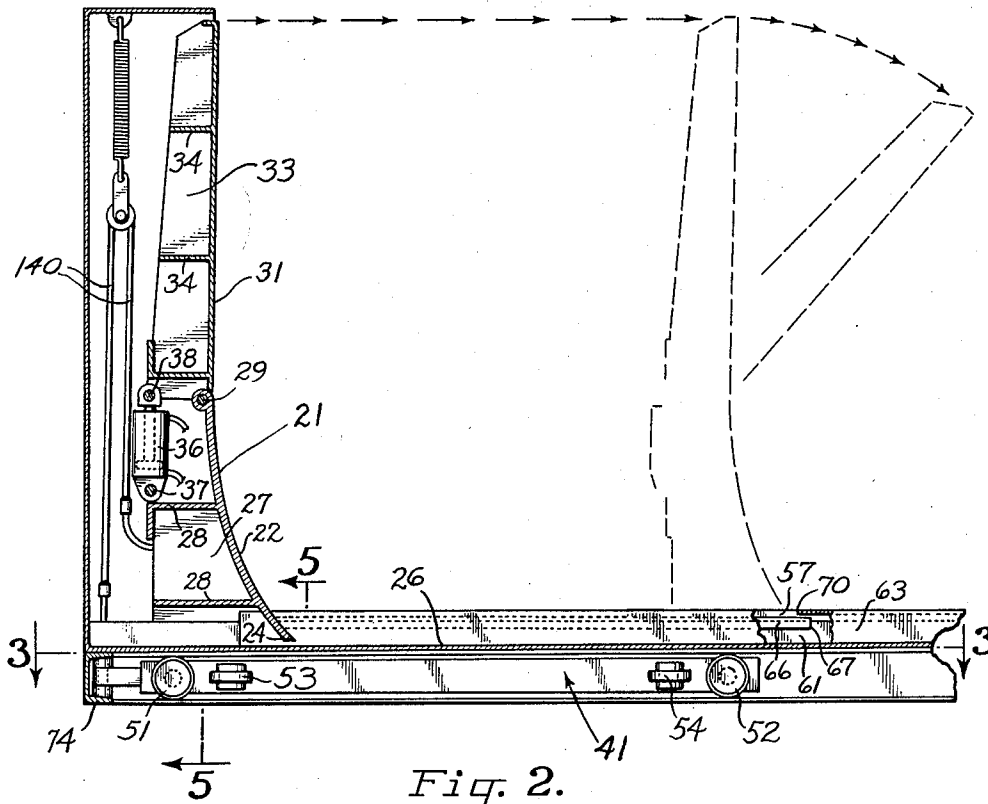
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E. F. KAMIN
REFUSE VEHICLE

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3 Sheets-Sheet 2



INVENTOR.
Ernest F. Kamin
BY
Ramsey and Kolisch
Attys.

Nov. 10, 1959

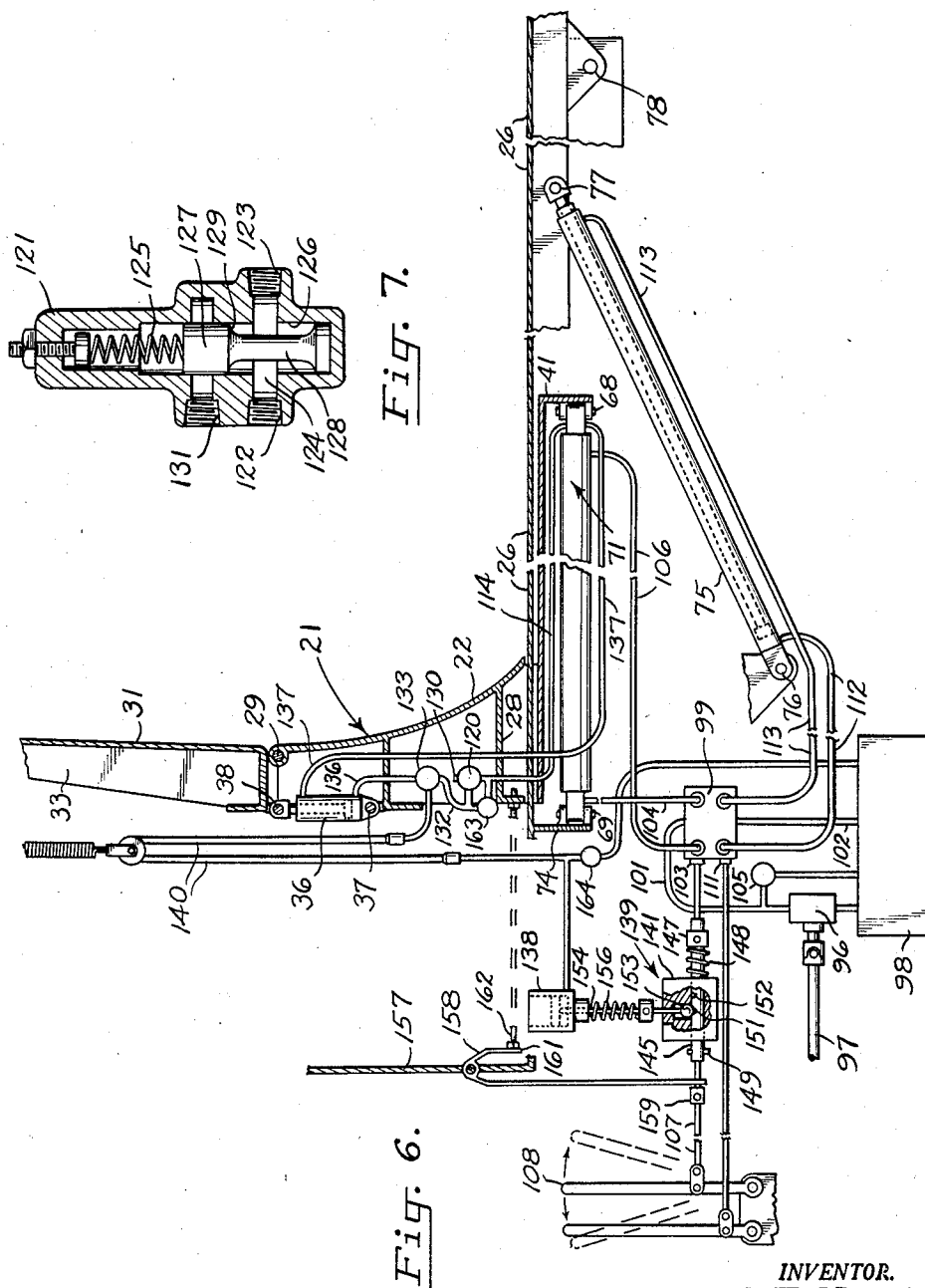
E. F. KAMIN

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REFUSE VEHICLE

Filed May 20, 1957

3 Sheets-Sheet 3



INVENTOR.

Ernest F. Kamin

BY

BY Ramsey and Kolisch
Attys.

Attyys.

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2,912,128

REFUSE VEHICLE

Ernest F. Kamin, Portland, Oreg.

Application May 20, 1957, Serial No. 660,357

8 Claims. (Cl. 214-82)

This invention relates to refuse collection vehicles generally, and more particularly to refuse collection vehicles having a hollow body for receiving refuse and a power-driven packer mechanism movable within the body for packing the refuse.

Generally, it is an object of this invention to provide an improved packer mechanism including a control mechanism wherein the packer mechanism, after it has been actuated, moves along the hollow body collecting refuse deposited in its path, the movement continuing until a predetermined amount of compaction is attained in the refuse, the packer mechanism then automatically returning to its retracted position to ready itself for a subsequent compaction stroke. The packer mechanism is characterized by a novel construction wherein the refuse is compacted so as to inhibit its tending to roll or to fall back loosely from its compressed state. The entire organization has been found to facilitate greatly loading of refuse in a collection vehicle and also to lengthen the life of the component parts of the vehicle since during a compacting stroke, maximum compression is maintained only for a relatively short time.

In the art to which this invention relates, it is conventional to mount a packer mechanism within the interior of a hollow refuse collection body for the purpose of increasing the amount of refuse carried by the body. Conventionally, power mechanism is provided for moving the packer mechanism to-and-fro in its path within the hollow body, the power mechanism including manually controlled means for stopping or starting the packer mechanism in its movement.

A feature of the present invention is the inclusion with packer mechanism for a refuse collection vehicle of control means regulating the actuation of the power means driving the packer mechanism so arranged that the compaction stroke of the packer mechanism is governed by the resistance encountered by the packer mechanism in compressing the refuse. At such time as the compaction of refuse reaches a certain predetermined level, the control means operates automatically to set the packer means for movement back to its rest or retracted position. This serves the dual function of speeding up the packing of refuse in the vehicle as well as reducing wear of the motor parts driving the packer mechanism.

Another feature of the present invention is the provision of means for shutting or cutting off the power means driving the packer mechanism when the packer mechanism moves back to its rest or retracted position. Whereas compressive movement of the packer mechanism is controlled by the resistance encountered by the packer mechanism, return movement of the packer mechanism is governed by the actual position of the mechanism. This is advantageous since the retracted position of the packer mechanism remains the same, whereas the compacting position changes depending upon the amount of refuse carried within the vehicle. According to this invention, return movement of the packer mechanism is

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controlled by a trip means tripped by movement of the packer mechanism into its retracted position. The trip means may be adjusted to accommodate minor adjustments in the retracted position of the packer mechanism.

5 The control mechanism for the packer mechanism is characterized by a number of novel features contributing to its utility. Specifically, the packer mechanism is driven by a fluid motor which is regulated in turn by means of a valve having a control member movable between a pack, a neutral, and a release position. The control member of the valve is connected by a rigid shaft to a suitable handle. Movement of the control member is transmitted through the shaft to the handle. In this manner, if the handle is located in the cab of the refuse vehicle, an opportunity is provided to determine the stage in the operating cycle for the packer mechanism at any given time by observing movements of the handle. For instance, when the control member occupies its neutral position and the packer mechanism is in its rest or retracted position, this position of the control member is reflected in a particular position of the handle. When the packer mechanism is moving towards its extended position thereby to compact refuse and when the packer mechanism is returning to its retracted position, the control member is moved to a pack and a release position, respectively. In each case, the handle attached to the control member occupies a certain position for each setting of the control member.

15 The construction employed in the present invention includes a biasing means urging the control member to its release position. The pack position for the control valve is obtained by moving the control member against the bias of the biasing means to a pack position, the control member being held in its pack position by a releasable detent mechanism. The releasable detent mechanism is operatively connected to the fluid motor so that when a pressure rise occurs in the pressure fluid in the fluid motor, the detent mechanism is released enabling the biasing means to urge the control member to its release position with a corresponding retraction of the packer mechanism. Intermediate these two positions is a hold or neutral position wherein the fluid motor for the packer mechanism is stopped. Movement of the packer blade into its retracted position operates to trip a trip mechanism which moves the control member to its neutral position thereby stopping movement of the packer mechanism.

20 In addition to the above novel features and objects, another object of this invention is to provide packer mechanism which includes a base blade portion movable along the floor of the hollow collection body thereby to scrape and pick up refuse from the floor, and a tamping blade portion pivotable relative to the base blade portion and operable to swing over the base blade portion and compress refuse downwardly toward the floor of the hollow body before return movement of the packer mechanism occurs. The tamping blade portion of the packer mechanism is driven by a separate fluid motor. By compressing the refuse downwardly against the floor of the collection body, the refuse is consolidated so that on withdrawal of the packer mechanism, the refuse tends to stay compacted without rolling or spewing out over the floor of the collection body. The motor driving the tamping blade portion is connected to the motor moving the packer mechanism back and forth in the refuse vehicle so that it automatically swings the tamping blade portion of the packer mechanism downwardly after a certain degree of compaction is obtained in the refuse. When the control member is adjusted to its release position, the packer mechanism moves back to its retracted position, and at the same time the tamping blade portion of the mechanism swings back to an upright position. In this manner, the packer mechanism in its rest or re-

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tracted position is properly set up for compacting another load of refuse deposited in front of the mechanism.

The fluid motor driving the packer mechanism in its movement back and forth within the refuse vehicle comprises a double-acting piston-cylinder arranged so that the piston area exposed to pressure fluid on the compacting stroke of the packer mechanism is considerably larger than the piston area exposed to pressure fluid on the return stroke of the mechanism. This enables, for a given pressure fluid supply, a maximum amount of force to be exerted on the compaction stroke and, at the same time, a relatively fast return of the packer mechanism to its retracted position. The fast return of the packer mechanism is an additional factor contributing to the usefulness of the refuse vehicle constructed according to this invention.

These and other features and novel objects are attained by the present invention, the invention being described hereinbelow in conjunction with the accompanying drawings wherein:

Fig. 1 is a side view of a refuse vehicle having a pivotable dump body supported on the frame of the vehicle and a packer mechanism movable in the body as contemplated by this invention;

Fig. 2 is a section view of the dump body equipped with a packer mechanism, illustrating portions of the carriage used for moving a packer blade in the dump body;

Fig. 3 is a view taken along the line 3—3 in Fig. 2;

Fig. 4 is a section view of a double-acting piston-cylinder such as may be used for moving the packer blade back and forth in the dump body;

Fig. 5 is a section view along the line 5—5 in Fig. 2, showing the mounting of the packer blade on the carriage for the blade;

Fig. 6 is a diagrammatic showing of the packer mechanism and its associated control mechanism; and

Fig. 7 is a section view of a sequence valve such as may be used in the control mechanism for the packer blade.

Referring to the drawings wherein an embodiment of this invention is illustrated, and more particularly to Fig. 1, 10 indicates generally a refuse vehicle having front and rear support wheels 11 and 12, respectively, a cab 13, and a pivotable dump body 14. Dump body 14 is pivotable between a dump position wherein refuse is ejected from a suitable opening in the rear end of the body and a load position wherein the body directly overlies the frame of vehicle 10, the position body 14 occupies in Fig. 1. Dump body 14 of the vehicle is conventional, having sides such as side 16, a floor, and roof structure to prevent refuse from being carried out of the body as the vehicle moves along the road. Each of the sides of the body are provided with an opening 17 which communicates with a complementary opening in the roof structure of the dump body, the side and roof openings permitting refuse to be thrown into the hollow interior of the dump body. As illustrated in Fig. 1, each of the side openings is provided with a sliding door 18, adapted to run along the side of the body and close the side opening when desired, as well as a lower swinging door section 19, pivoted to the body along its lower edge so as to swing downwardly therefrom.

Mounted for movement longitudinally back and forth within the hollow dump body, between a retracted position located forwardly in the body and an extended or compression position located rearwardly in the body, is a packer mechanism indicated generally at 21. Referring to Figs. 2, 3, and 5, packer mechanism 21 includes a curved base blade portion 22 having its concave compression face facing the rear of the dump body and with its bottom edge 24 closely adjacent floor 26 of the dump body. The face of blade 22 curves upwardly toward the front of the truck in substantially an unbroken curve from the bottom edge of the blade. The curvature of

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blade 22 is selected so that it does not create a large undercut in refuse collected by the blade yet is sufficient to scrape refuse up off the floor and push it along with a slight amount of upward thrust in front of the packer mechanism. Blade 22 is braced along its rear face by means of vertical frame members, such as frame member 27, and transverse beams 28.

Pivotally mounted as by hinge 29 along the top edge of base blade 22 is an upper or tamping blade portion 31. Tamping blade 31 has a substantially flat compression face and is braced by vertical frame members, such as frame members 33, and transverse beam members 34. Base blade portion 22, in curving up from floor 26, flattens out near its upper edge so that there is substantially a continuous curve from the bottom edge of base blade 22 to the top edge of tamping blade 31.

A double-acting piston-cylinder 36 or fluid motor, pivotally mounted as at 37 and 38 to frame structure of the base blade portion and the tamping blade portion, respectively, provides a means for swinging the tamping blade portion downwardly over refuse collected by the packer mechanism in moving rearwardly in the dump body, from the position shown in solid lines in Fig. 2 to the inclined position indicated by the dotted lines in Fig. 2. In this way, when the piston-cylinder 36 is actuated, compression face 32 serves to exert a downward tamping pressure on refuse collected in the vehicle, thereby to further consolidate refuse compressed by the packer mechanism into a more compact mass.

Packer mechanism 21 is mounted for movement back and forth within the hollow body of the dump truck on a carriage indicated generally at 41. As seen in Figs. 3 and 5, the carriage includes a box-like structure having side walls 42 and 43 and top and bottom walls 44 and 45, respectively. The blades of the packer mechanism are mounted on packer carriage 41 as by welding the lower ends of vertical members 27 to the upper wall of the packer carriage. The carriage is mounted to reciprocate back and forth in channel guides 46 and 47 secured to the underside of floor 26 for the dump body and disposed longitudinally beneath the floor.

A front set of wheel mounts 51 and a rear set of wheel mounts 52 steady the carriage within top and bottom flanges 39 and 40 of the channel guides. The diameter of the wheels is slightly less than the spacing of the flanges so that they ride either on the top or on the bottom flanges. Another set of wheels, front wheels 53 and rear wheels 54, steady the carriage from skewing from one side to the other within the guides. These wheels bear against webs 55 of the channel guides.

Vertical frame members 27 project downwardly past the floor of the dump body through accommodating slots formed in the floor. These slots are indicated in Fig. 5 at 57. Since refuse many times is quite gooeey and contains a considerable amount of water, a covering is provided for shielding the slots so that refuse is not carried through the slots into the carriage structure mounting the packer mechanism. With references to Figs. 2 and 5, this covering includes for each of the slots a pair of elongated perpendicular flanges 61 and 62 affixed to the floor of the dump body and disposed on either side, respectively, of frame member 27, and a second pair of L-shaped flanges 63 and 64 spaced outwardly from flanges 61 and 62 also affixed to floor 26. An elongated channel shaped sleeve 66 slides within the space bounded by flanges 61, 62 and 63, 64. The forward end of sleeve 66 is affixed to the packer mechanism so that the sleeve slides with the packer mechanism. Sleeve 66 moves rearwardly in the dump body with the packer mechanism, and space is provided in the rear end of the dump body to accommodate the sleeve when the packer mechanism is moved to its extended position. When the packer mechanism is in its retracted position, as shown by the solid lines in Fig. 2, the rear edge of channel sleeve 66,

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indicated in Fig. 2 at 67, extends under and just beyond lip 70 defined by the end of a slot 57.

The carriage structure described for the packer mechanism enables the use of a single fluid motor for moving the packer mechanism to-and-fro in the dump body of the vehicle as the force of the fluid motor is imparted directly to center portions of the packer mechanism. The fluid motor is indicated generally in Fig. 3 by piston-cylinder 71. Piston-cylinder 71 is connected at one of its ends to carriage 41 as by pivot connection 68 and at the other of its ends to a frame member 74 secured to the under side of floor 26 as by pivot connection 69.

Referring to Fig. 1, another piston-cylinder 75 pivoted at 76 to the frame of the truck and at 77 to the frame of the dump body is provided for tipping the dump body, the dump body pivoting in a conventional manner about pivot 78. As discussed hereinabove, piston-cylinder 71 which moves the packer mechanism back and forth in the dump body, is constructed so that the piston area exposed to pressure fluid on the compacting stroke of the packer mechanism is considerably larger than the piston area exposed to pressure fluid on the return stroke of the packer mechanism when it moves back to its retracted position. This is done so that a large force may be created during the compacting stroke, and the packer mechanism will be returned at a relatively fast speed.

Referring in particular to Fig. 4, a fluid motor 71 comprises in general a cylinder portion 79 secured at one end as by screws to a cupped head 80 and welded at its other end to an annular head member 81. Affixed to head member 81 by screws is a packing gland 82. Extending through the middle of packing gland 82 and annular head 81 is a tubular piston rod 83 mounted for reciprocation within cylinder 79. Tubular piston rod 83 has wall portions 84 and 85 at opposite ends of the rod. A hollow conduit 86 screwed into wall 84 at one end of the rod extends down the length of the rod and out the other end of the rod through wall 85. Fastened to the exterior side of wall 85 as by nut 87 turned on a threaded end of conduit 86 is a piston element 88.

A port 89 in head 80 communicates with the cavity between head 80 and piston element 88. This cavity in turn is connected by the interior of conduit 86 with a port 90 in wall 84 of the tubular piston rod. Thus, when pressure fluid is admitted into port 89, the fluid exerts a force on the front face of piston element 88, which has a relatively large area, and also will tend to be forced through conduit 86 to port 90.

A passage 92 in wall 84 communicates with the annular space between the interior of hollow piston rod 83 and the exterior of conduit 86. Adjacent wall 85 of the piston rod are a pair of ports 93 connecting this annular space with the annular space between the interior of cylinder 79 and the exterior of hollow rod 83. A passage 94 and an annular groove 95 provide for the flow of fluid into and out of the annular space between the interior of cylinder 79 and the exterior of hollow rod 83. Thus, when pressure fluid is admitted into passage 94, the fluid exerts a force on that portion of the rear face of piston element 87 located between rod 83 and cylinder 79, which has a relatively small area and also tends to be forced through ports 93 to passage 92.

Control or regulating means are provided for regulating the movement of the packer mechanism back and forth within the dump body. The control mechanism is so arranged that the packer mechanism moves rearwardly in the dump body towards its extended position until a predetermined resistance to movement is encountered by the packer mechanism by reason of the refuse compacted or compressed by the mechanism. After a certain degree of compression is obtained in the refuse, fluid motor 71 driving the packer mechanism is reversed so that the packer mechanism is returned to its rest or retracted position. On reaching its retracted position, the packer

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mechanism trips a trip means operable to shut off fluid motor 71 driving the packer mechanism. Further, means are provided for actuating piston-cylinder 36 pivoting the tamping blade portion of the packer mechanism downwardly on top of the refuse before the packer mechanism is returned to its retracted position.

The details of the control system are best illustrated in Fig. 6 taken in conjunction with Figs. 4 and 7. With reference to Fig. 6, a pump 96, driven by a power take-off shaft 97 connected to the engine for the refuse vehicle, pumps hydraulic pressure fluid from a reservoir 98 to a control valve indicated at 99. This valve is carried on the frame of vehicle 10 underneath the pivotable dump body 14. Control valve 99 is a standard two-spool valve with pressure fluid entering one side of the valve by conduit 101 and exhaust fluid leaving the valve at the other side of the valve by conduit 102. A conventional relief valve 105 is connected across the outfeed side of pump 96 and reservoir 98. One of the spools 103, which constitutes a control member governing the operation of motor 71, controls inlet and exhaust connections to conduits 104 and 106 feeding pressure fluid to the ends of piston-cylinder 71. Valve spool 103 is adjustable to a position wherein conduit 104 is connected to the pressure fluid source and conduit 106 is connected to exhaust, another position wherein conduit 104 is connected to exhaust and conduit 106 is connected to the pressure fluid source, and a third or neutral position wherein both conduits 104, 106 are cut off from the source of pressure fluid. Spool 103 is connected by a shaft 107 to a suitable handle 108 provided to actuate the spool back and forth in valve 99. The other of the spools 111 of valve 99 is used for controlling inlet and exhaust connections to conduits 112 and 113 supplying pressure fluid to either side of piston-cylinder 75.

Conduit 104, which is connected at one end to valve 99, is connected at its other end to passage 89 of motor 71 illustrated in Fig. 4. Conduit 106 extends from valve 99 to passage 94 of motor 71. Thus, when piston element 88 moves to the right in Fig. 4, pressure fluid flows into motor 71 through passage 89 and out of motor 71 through passage 94. Conversely, if piston element 88 moves to the left in Fig. 4, pressure fluid flows into motor 71 through passage 94 and out of motor 71 through passage 89.

Port 90 of motor 71, which communicates with passage 89 by means of hollow conduit 86, is connected by a conduit 114 to a sequence valve 120. Sequence valve 120 is conventional and is illustrated by the sequence valve 121 in Fig. 7.

Referring to Fig. 7, the valve has a pair of through ports 122 and 123 communicating with each other by means of a passage 124. Within the interior of the sequence valve and slidable up and down in a valve bore 126 is a valve spool 127. Valve spool 127 is provided with a constricted portion 128 enabling fluid to flow at all times from port 122 past the valve spool to port 123. When the pressure of pressure fluid within passage 124 reaches a predetermined level, the pressure fluid acts against a shoulder 129, defined by the constricted portion of the valve spool, to push the valve spool upwardly in its housing against the bias of a spring 125 and connect passage 124 and valve bore 126 with a relief passage or bore 131.

Conduit 114 is connected to one of the through ports of sequence valve 120, and the other of the through ports of sequence valve 120 is closed by a plug 130. The relief port of sequence valve 120 is connected by a conduit 132 to one of the through ports of a second sequence valve 133. The other of the through ports of sequence valve 133 is connected by a conduit 136 to the lower end of piston-cylinder 36. A conduit 137 connected to the upper end of piston-cylinder 36 connects the piston-cylinder with passage 92 of motor 71 and the annular space between the

interior of hollow rod 83 and the exterior of conduit 86. Connected at one end to the relief port of sequence valve 133 is a conduit 140, communicating at its other end with a single action piston-cylinder 138.

With reference again to Fig. 6, piston-cylinder 138 operates a releasable detent lock mechanism, indicated generally at 139, controlling the position of valve spool 103. Detent lock mechanism comprises a housing structure 141 affixed to the frame of the vehicle adjacent valve 99 and slidably mounting a detent sleeve 145 extending through the housing. Detent sleeve 145 ordinarily may be affixed to shaft 107 connecting handle 108 to valve spool 103. Handle 108 is pivoted in cab 13 of the vehicle to enable the operator to control the packer mechanism from the cab of the vehicle.

Affixed to one end of detent sleeve 145 is a spring retainer cap 147 seating one end of a compression spring 148. The other end of the compression spring is seated against the housing for the detent lock mechanism. Spring 148 is operable to thrust detent sleeve 145 and shaft 107 to the right in Fig. 6 relative to housing 141 which is stationary. The limit position for movement of sleeve 145 to the right in Fig. 6 is determined by a collar 149, which is affixed to the sleeve, striking housing 141.

Detent sleeve 145 is provided with a pair of notches 151 and 152, respectively. Mounted in housing 141 above the detent sleeve in a small bore is a ball element 153. Ball 153 is urged against the upper surface of the detent sleeve by means of a rod 154 which is connected to the piston of piston-cylinder 138. A compression spring 156 operates to urge rod 154 downwardly against the top of ball 153.

Pivotaly mounted on a forward wall 157 of the dump body of the vehicle is a trip lever or element 158. The forward end of the trip lever is bifurcated and seats about shaft 107 when the dump body is in a load position and lying flat on the frame of the truck. Since the trip lever is pivoted to a wall of the dump body of the refuse vehicle, upon raising the dump body, the lever is lifted off of shaft 107. Affixed to shaft 107 in front of the bifurcated end of the shaft is a collar 159. The bifurcated end of lever 158 strikes collar 159 upon rotation of the lever in a clockwise direction as viewed in Fig. 6 thereby to move the collar and the control shaft connected thereto to the left in Fig. 6.

Trip lever 158 is provided with another arm 161 depending within the interior of the dump body. Arm 161 is aligned with an adjustable abutment pin 162 carried by the packer mechanism. The abutment pin protrudes forwardly of the packer mechanism, and when the packer mechanism is moved into its retracted position, strikes arm 161 of lever 158 thereby to rotate the lever so as to cause movement of collar 159 and the control shaft to the left in Fig. 6.

The operation of the foregoing will now be described: When it is desired to run the packer mechanism so as to compact refuse in the dump body, power take-off shaft 97 is driven by the engine for the refuse vehicle so as to actuate pump 105. Adjustment of handle 108 forwardly to the position shown in the forward set of dotted lines in Fig. 6 serves to pull detent sleeve 145 forwardly within the housing of the detent lock mechanism until the rear notch 152 of the detent sleeve comes under ball 153. Spring 156 then urges the ball into the notch releasably locking detent sleeve 145 and shaft 107 in this position. In this position, valve spool 103 is pulled out of valve 99 so that it occupies its "pack" position. In its pack position, the valve spool directs pressure fluid delivered by conduit 101 into conduit 104 and the left hand end of piston-cylinder 71, and connects conduit 106 with conduit 102 so as to enable exhaust of fluid from the right hand end of motor 71.

The admission of pressure fluid into the left hand end of piston-cylinder 71 causes the hollow piston rod of the piston-cylinder to move rearwardly inside of cylinder 79 with corresponding movement of the packer mechanism

towards its extended position. Exhaust of fluid from motor 71 takes place through conduit 106. Conduit 86, within hollow piston rod 83 of the piston-cylinder, also delivers pressure fluid into conduit 114 and one of the through ports of sequence valve 120. Since the other of the through ports of sequence valve 120 is closed, the flow of fluid through conduit 114 is initially blocked so that the admission of pressure fluid into the left hand end of motor 71 causes at first only rearward movement of the packer mechanism.

As the packer mechanism moves rearwardly and compresses refuse deposited in front of the mechanism, the hydraulic pressure within piston-cylinder 71 increases as well as the hydraulic pressure within conduit 114. When the pressure of the pressure fluid reaches a predetermined level, the relief port of the sequence valve opens, and pressure fluid is admitted into one of the through ports of sequence valve 133. The other of the through ports for valve 133 is connected by conduit 136 to motor 36 so that at this time motor 36 is actuated with movement of the tamping blade portion of the packer mechanism downwardly over refuse collected by the mechanism. Exhaust of fluid from the upper end of piston-cylinder 36 takes place through conduit 137, the annular passages within piston-cylinder 71, and conduit 106. As the tamping blade portion of the packer mechanism moves downwardly against refuse deposited thereunder, the pressure within conduits 136, 132, and 114 increases until such time as the relief port of sequence valve 133 opens. When this relief port opens, pressure fluid is directed by the sequence valve through conduit 140 into piston-cylinder 138. This causes the piston in the piston-cylinder to rise against the bias of spring 156, releasing the releasable detent lock. Upon release, compression spring 148 functions to urge sleeve 145 and spool 103 to the right in Fig. 6, to the right limit position for sleeve 145 determined by collar 149 striking housing 141.

In this condition of the parts, spool 103 occupies its "release" position and pressure fluid is directed by the valve spool into conduit 106 and the right hand side of piston-cylinder 71. Pressure fluid is exhausted from the piston-cylinder by conduit 104. As a consequence, the hollow piston rod of piston-cylinder 71 is contracted within the piston-cylinder by reason of the hydraulic pressure existing in the annular space between the interior of cylinder 71 and the exterior of hollow piston rod 83.

At the same time that pressure fluid is admitted to the right hand side of piston-cylinder 71, pressure fluid is also directed by the annular space between the interior of the hollow piston rod and the exterior of the conduit 86 into conduit 137 and the upper end of piston-cylinder 36. This causes the tamping blade portion of the packer mechanism to move back to its original upright position. The exhaust from piston-cylinder 36 takes place through conduit 136, sequence valve 133, a check valve 163, and conduit 114. The check valve 163 is provided to by-pass sequence valve 120 since conduit 132 is connected to the relief port of sequence valve 120, and return flow of pressure fluid cannot take place through the valve. In this manner, movement of the packer mechanism rearwardly to its retracted position and movement of the tamping blade portion of the packer mechanism to its upright position occurs simultaneously.

A small bleeder valve 164, interposed between conduit 140 feeding single acting piston-cylinder 138 and conduit 102 connected to reservoir 98, accommodates the slow exhaust of pressure fluid from piston-cylinder 138 after it has been actuated. This enables the detent lock mechanism to ready itself for subsequent operation of the mechanism.

The packer mechanism continues its travel rearwardly in the dump body until abutment pin 162 engages arm 161 of trip lever 158. This causes the trip lever to rotate in a clockwise direction about its pivot causing the

forward bifurcated end of the lever to engage collar 159 thereby to move the shaft 107 to the left in Fig. 6. This operates to move valve spool 103 of valve 99 to its neutral position at which time ball 153 of the detent lock mechanism engages the notch 151 in the detent sleeve as illustrated in Fig. 6. In its neutral position, the supply of pressure fluid to conduits 104, 106, and piston-cylinder 71 is cut off, and the packer mechanism comes to rest.

It will be noted that during the operation of the control mechanism, handle 108 is moved in its mounting along with and at the same time as valve spool 103. Thus, if the handle is mounted inside the interior of the cab of the vehicle, as shown in Fig. 1, it allows a means for the operator to determine from within the cab that part of the operating cycle for the packer mechanism which is occurring at any given time.

It will be also noted that the movement of the packer mechanism to its extended position is governed by the resistance encountered by the packer mechanism. In this way, the packer mechanism functions to produce, for each stroke of the mechanism, a constant degree of compression in the refuse compacted. The pivotal movement of the tamping blade portion of the packer mechanism cooperates with the movement of the packer mechanism in compressing the refuse. It is important that the tamping blade portion start its downward movement only after an initial amount of compaction is obtained in the refuse since this helps to prevent the refuse from accumulating excessively along the base of the dump body. It should further be noted that adjustment of the valve spool 103 to its neutral position occurs when the packer mechanism reaches its retracted position and is not dependent on the pressure of the pressure fluid in the fluid motors used.

The entire organization of this invention has been found to greatly speed up the collection of refuse. Further, it may readily be incorporated with existing refuse vehicles.

It is claimed and desired to secure by Letters Patent:

1. In a refuse collection vehicle having a hollow body for collecting refuse, packer means movable in a path longitudinally in said body for compacting refuse therein, said packer means having a base blade portion and a tamping blade portion disposed above said base blade portion and operable to swing downwardly over refuse collected by said packer means, a first motor means for moving said packer means in said path, a second motor means swinging said tamping blade portion, and means operatively interposed between said first and second motor means operable to actuate said second motor means after a given load is encountered by said packer means in moving in said path by reason of refuse collected by said packer means.

2. In a refuse collection vehicle having a hollow body for collecting refuse, packer means for compacting refuse movable in a path between an extended position and a retracted position located rearwardly and forwardly in said body, respectively, said packer means having a base blade portion and a tamping blade portion disposed above and pivotable relative to said base blade portion so as to swing downwardly over refuse collected by said packer means, a first motor means for moving said packer means between its extended and retracted positions, a second motor means for pivoting said tamping blade portion, and regulating means controlling the operation of said first and second motor means, said regulating means having a control member adjustable to a pack position to actuate said first motor means for moving said packer means towards its extended position and a release position to actuate said first motor means for moving said packer means towards its retracted position, and means responsive to a predetermined resistance encountered by said packer means in moving towards its extended position operable first to actuate said second

motor means so as to pivot said tamping blade portion and then to adjust said control member to its release position so as to actuate said first motor means for moving said packer means to its retracted position.

3. In a refuse collection vehicle having a hollow body for collecting refuse, packer means movable in a path for compacting refuse therein, said packer means having a base blade portion and a tamping blade portion disposed above and pivotable relative to said base blade portion operable to swing downwardly over refuse collected by said packer means, a first motor means for moving said packer means between its extended and retracted positions, a second motor means for pivoting said tamping blade portion, and regulating means controlling the operation of said first and second motor means, said regulating means having a control member adjustable to a pack position to actuate said first motor means for moving said packer means towards its extended position, a release position to actuate said first motor means for moving said packer means to its retracted position, and a neutral position stopping movement of said packer means by said motor means, means responsive to a predetermined resistance encountered by said packer means in moving towards its extended position operable first to actuate said second motor means so as to pivot said tamping blade and then to adjust said control member to its release position so as to actuate said first motor means for moving said packer means to its release position, and means adjusting said control member to its neutral position when said packer means moves into its retracted position.

4. For a refuse collection vehicle having a packer means movable longitudinally in a vehicle between extended and retracted positions thereby to compact and move away from refuse collected by the packer means, said packer means having a base blade portion and a tamping blade portion disposed above and pivotable relative to said base blade portion, said tamping blade portion being operable to swing downwardly over refuse collected by said base blade portion, a first fluid motor means for moving said packer means between its extended and retracted positions, a second fluid motor means for pivoting said tamping blade portion, a control valve regulating the supply of pressure fluid to said first and second fluid motor means, means operatively interposed between said first and second fluid motor means operable to actuate said second fluid motor means in response to a predetermined pressure of the pressure fluid in said first fluid motor means, said control valve having a control member adjustable to a pack position to actuate said first motor means for moving said packer means towards its extended position, a release position to actuate said first motor means for moving said packer means towards its retracted position, and a neutral position for stopping movement of said packer means by said first fluid motor means, releasable detent means holding said control member in said pack and neutral positions, biasing means urging said control member to said release position, pressure responsive means releasing said detent means after actuation of said second motor means, and trip means tripped by movement of said packer means into its retracted position adjusting said control member to said neutral position.

5. In a refuse collection vehicle, a vehicle frame, a hollow pivotable body for collecting refuse carried on said frame and pivotable between loading and dump positions, packer means movable between extended and retracted positions longitudinally in said body thereby to compact and move away from refuse collected by said packer means, fluid motor means carried by said pivotable body for movement therewith, said fluid motor means moving said packer means between said extended and retracted positions, a control valve carried by said vehicle frame regulating said fluid motor means, said control valve having a control member adjustable to a

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pack position to actuate said fluid motor means for moving said packer means towards its extended position, a release position to actuate said fluid motor means for moving said packer means towards its retracted position, and a neutral position stopping movement of said packer means by said fluid motor means, releasable detent means holding said control member in said pack and neutral positions, biasing means urging said control member to said release position, pressure responsive means releasing said detent means in response to predetermined pressure of the pressure fluid in said fluid motor means created by said packer means encountering refuse in moving towards its extended position, and a trip element carried by said pivotable body co-operating with catch means carried by said vehicle frame for adjusting said control member to said neutral position, said trip element being tripped by movement of said packer means into its retracted position, and engaging said catch means when said pivotable body is in its load position.

6. In a refuse collection vehicle, a vehicle frame, a hollow pivotable body for collecting refuse carried on said frame and pivotable between loading and dump positions, packer means movable between extended and retracted positions in said body thereby to compact and move away from refuse collected by said packer means, said packer means having a base blade portion and a tamping blade portion disposed above and pivotable relative to said base blade portion, said tamping blade portion being operable to swing downwardly over refuse collected by said packer means, a first fluid motor means carried by said pivotable body for moving said packer means between its extended and retracted position, a second fluid motor means carried by said pivotable body for pivoting said tamping blade portion, a control valve mounted on said vehicle frame regulating the supply of pressure fluid to said first and second fluid motor means, means interposed between said first and second fluid motor means operable to actuate said second fluid motor means in response to a predetermined pressure of the pressure fluid in said first fluid motor means, said control valve having a control member adjustable to a pack position to actuate said first motor means for moving said packer means towards its extended position, a release position to actuate said first motor means for moving said packer means towards its retracted position, and a neutral position stopping movement of said packer means by said first fluid motor means, releasable means for holding said control member in said pack and neu-

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tral positions, biasing means urging said control member to said release position, pressure responsive means releasing said detent means after actuation of said second fluid motor means, and a trip element carried by said pivotable body co-operating with catch means carried by said vehicle frame for adjusting said control member to said neutral position, said trip element being tripped by movement of said packer means into its retracted position and engaging said catch means when said pivotable body is in its load position.

7. In a refuse collection vehicle having a hollow body for collecting refuse, packer means for compacting refuse deposited in said hollow body, said packer means having a pair of blade portions mounted within said hollow body, a first motor means for moving one of said blade portions and a second motor means for moving the other of said blade portions, and means operatively interposed between said first and second motor means operable to actuate said second motor means after a given load is encountered by said one blade portion by movement of said one blade portion against refuse in response to actuation of said first motor means.

8. In a refuse collection vehicle having a hollow body for collecting refuse, packer means for compacting refuse deposited in said hollow body, said packer means having a pair of blade portions mounted within said body, a first motor means for moving one of said blade portions and a second motor means for moving the other of said blade portions, and regulating means controlling the operation of said first and second motor means, said regulating means having a control member adjustable to a pack position to actuate said first motor means in one direction and a release position to actuate said first motor means in the opposite direction, and means responsive to a load encountered by said one of said blade portions operable first to actuate said second motor means and then to adjust said control member to its release position.

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